

# Manufacturing Industry Scenarios in 2023: Leading Through Innovation

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Extraordinary technological, market and societal challenges confront the manufacturing industry. To envision the future, CIOs must recognize and act on critical internal and external factors. Our manufacturing scenarios provide CIOs with insight and advice on how to drive value with innovation.

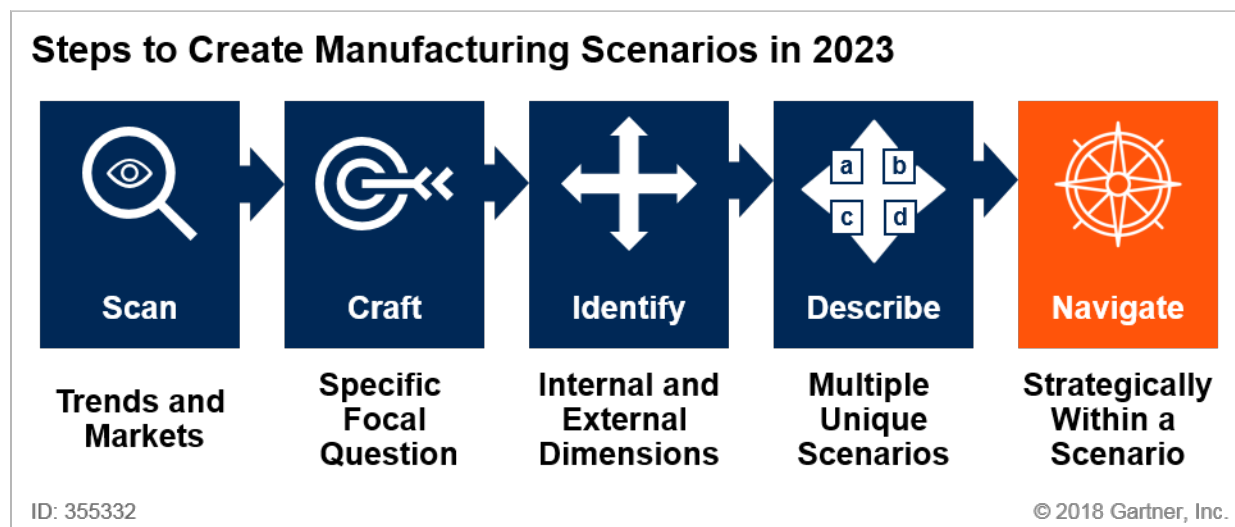
**FOUNDATIONAL DOCUMENT**This research is reviewed periodically for accuracy. Last reviewed on **4 February 2020**.

## Analysis

Manufacturers worldwide face shifts that they must be prepared to capitalize on or risk the competitive consequences. Regardless of what the company makes — cereal, clothing, toys, turbines, phones, drones or anything — CIOs will face an uncertain future that comes at them faster and faster. For many manufacturers, just staying on top of orders is a challenge. So, thinking about the future is often at the bottom of their list of priorities.

Technologically driven disruptions will cause manufacturing CIOs to play an increasingly important role in forecasting the future. Yet it is not always clear what an individual trend means to the business or the IT organizations. Against this backdrop, a Gartner multidisciplinary team created manufacturing scenarios that consider the factors influencing manufacturers across industries through 2023 and the impact of those developments on the areas within the CIO's responsibilities (see Note 1). The team used a five-step process to create four possible future scenarios (see Figure 1).

Figure 1. How We Created the Four Scenarios



Source: Gartner (September 2018)

The five steps are described in more detail:

- **Scan** — A good market scan requires diversity of thought and information sources. We used the social, technological, economic, environmental and political (STEEP) method to accomplish this step.
- **Craft** — We crafted a single focal question that grounds and provides a foundation for the scenarios.
- **Identify** — We defined one internal dimension and one external dimension that are clearly linked to the focal question. These dimensions have endpoints that are distinct from one another so that each scenario illuminates different options.
- **Describe** — We identified words and phrases and, ultimately, a name that describes each scenario.
- **Navigate** — We defined what to do and how to act or prepare for the future as the final step.

## The Focal Question

After scanning the market using the STEEP methodology, the Gartner team identified the focal question:

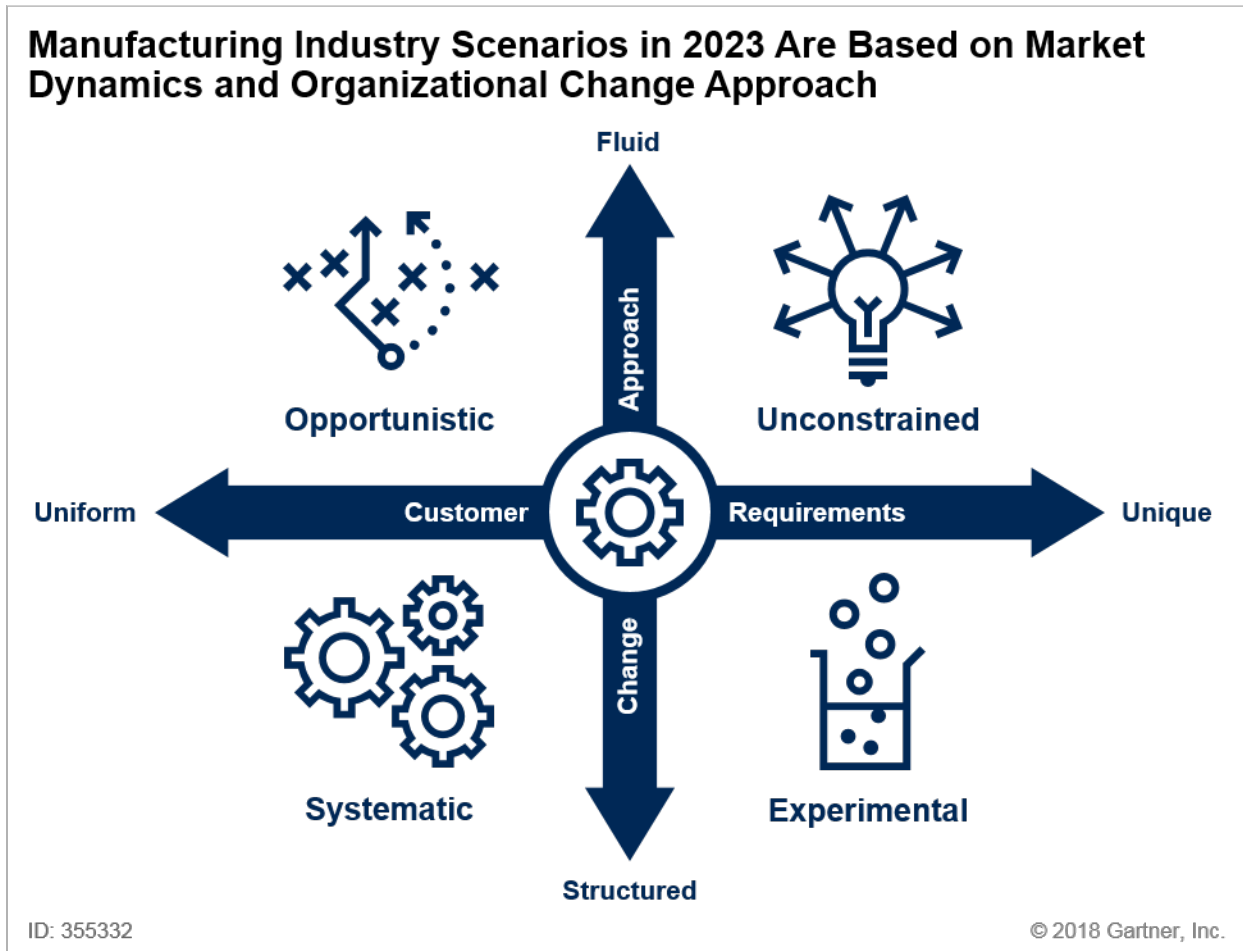
### How will manufacturers innovate to drive value?

This question applies to many dimensions: processes, people, culture, operations, infrastructure, technology and resources. It also helps balance provider and customer perspectives (supply and demand) with the impact of dynamics and forces from outside the industry.

As noted above, one of the disciplines around building a scenario is to have one internal dimension and one external dimension. This means that, while the company is in some ways at the whim of the market that it competes in, CIOs also have things they can control (see Note 2).

After identifying the key focal question, the Gartner team applied trends in customer requirements and markets (external), and the way that enterprises approach change (internal). The result is a description of four likely scenarios and advice on how to navigate those possible futures (see Figure 2).

Figure 2. Internal and External Factors Drive Manufacturing Scenarios in 2023



Source: Gartner (September 2018)

Every company perceives and approaches innovation differently. Enterprises with numerous brands, product lines, services and business units will likely face multiple futures — a complex situation that is compounded if they operate in many markets or countries. Likewise, a company that does not succeed in one scenario may transform, align with another scenario and achieve success. The primary goal of these scenarios is to drive companies to think about how innovation will contribute to their scenario by 2023 and what it will take to be successful in that future environment.

## Internal and External Factors Driving the Scenarios

We used a combination of external factors (customer requirements) and internal factors (approach to change) as our basis for the scenario framework. While it would be easy to focus on the extremes of each factor, the reality is that, in any given circumstance, customers and companies are somewhere along the spectrum. Indeed, many of the largest companies will have segments of their businesses (by product, channel or market) that are at different points along the axis.

Customer requirements are the met and unmet demands of manufacturers' buyers and prospective purchasers (see Figure 3).

Figure 3. External Factors Driving the Manufacturing Industry Scenarios

External Factors Driving the Scenarios		
Factor	Uniform	Unique
Regulatory	Stable	In Flux
Financial	Low Cost	High Margin
Capacity	Plentiful	Constrained
Demand	Stable	Fluctuating
Volume	Mass Production	One-Off

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Source: Gartner (September 2018)

### Customer Requirements

The dimensions of this element range from uniform to unique:

- Uniform** — At this end of the spectrum, customer requirements rarely (if ever) vary or deviate from order to order. The physical products are nearly indistinguishable, and customer needs are consistent in the aggregate. One customer's needs are the same as every other customer's needs, whether because the items are commodity consumable items, such as nuts and bolts, or highly regulated products, such as pharmaceuticals. The products are typically manufactured at a high volume, as stable, predictable customer demand and slow-evolving feature evolution result in long-lasting product cycles. Innovation focuses on creating and sustaining the extremely efficient supply chains and production and quality assurance processes, which result

in high barriers to entry for new manufacturers. Manufacturers often provide a service offering to distinguish from their competitors' almost indistinguishable product offerings.

- **At the midpoint** — Product and service configuration increases, as manufacturers move along the spectrum to its midpoint. Order sizes get smaller as the items become less and less alike. Automobile manufacturers that offer a limited variety of options for certain low-price models would be near the midpoint. From day to day, they know how many cars will be assembled in a given color, and they plan accordingly. Yet all of the steel car bodies are stamped with the same tooling.
- **Unique** — At this end of the spectrum, customer requirements frequently (if not always) are for customized or personalized items. Products and services resemble highly specialized, precise solutions to customer problems, and customer pools tend to be extremely small. Customers prefer (if not demand) goods that are distinctive, one-off or unusual. The degree of personalization found here is epitomized by items as diverse as 3D-printed medical devices used to reconstruct a patient's skull after a traumatic injury and handcrafted precious metal jewelry. Product and service innovations reflect as well as drive the market.

### Approach to Change

While customer requirements are external factors, the approach taken to changing customer requirements reflects manufacturers' internal operations and culture (see Figure 4).

Figure 4. Internal Factors Driving the Manufacturing Industry Scenarios

Internal Factors Driving the Scenarios		
Factor	Structured	Fluid
Governance	Centralized	Decentralized
Management	Prove ROI	Transformation
Partnership	Traditional	Creative
Focus	Internal/Asset	External/Customer
Innovation	Prefer Proven	Embrace All

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Source: Gartner (September 2018)

How manufacturers view and react to change (including opportunities for process and product innovation) dictates how they will react to market forces and, indeed, to changes in the organization's business model. The dimensions of this element range from structured to fluid:

- **Structured** — At this end of the spectrum, manufacturers handle change in a planned, systematic, controlled manner. Centralized decisions are the norm. Risk taking is discouraged, either by management's culture or through stringent ROI requirements that put up high approval hurdles. A structured approach to change is often found in highly regulated industries producing uniform products and manufacturing startups with limited access to capital.
- **At the midpoint** — The organization becomes more open and willing to undertake riskier equipment investments and to pursue novel product ideas. Management becomes more willing to accept input and suggestions from not only customers but also employees. Management will try to balance the need for structure in their core business with openness to change. For example, they may set up a nearby satellite operation to test out new processes and products without disrupting the primary operation.
- **Fluid** — At this end of the scale, manufacturers approach change more adaptively and are comfortable with unpredictability and fluctuations. Not unlike some software companies, these manufacturers are willing to fail (just not too fast or too often because, after all, they are for-profit businesses). Good examples are the athletic footwear companies that are setting up operations that use 3D printing and other advanced manufacturing techniques to produce unique footwear in high volume. This external customer focus drives their willingness to incubate and constantly innovate products and processes, and develop creative partnerships. In many cases, the entire company is not fluid, but individual business units have fluid change as part of their core principles. Short product life cycles and rapid advancements in underlying technologies are attributes. These companies may have outsourced operations to couple and decouple suppliers quickly.

## Four Manufacturing Industry Scenarios for 2023

Our team decided to look five years into the future. 2023 is far enough away to foresee realistic market- and technology-changing trends, yet near enough for manufacturers to determine whether they must begin transforming their organizations now. This introductory overview and four scenario reports are designed to help CIOs at manufacturing companies plan and execute their information technology initiatives:

- “Manufacturing Industry Scenarios in 2023: Protect the Franchise”
- “Manufacturing Industry Scenarios in 2023: Find the Right Things to Do, and Do Them Faster and Better”
- “Manufacturing Industry Scenarios in 2023: Pioneer New Sectors”
- “Manufacturing Industry Scenarios in 2023: Drive Innovation With Data”

These scenarios *do not* represent or illustrate a Magic Quadrant. Moreover, there are no good or bad scenarios. These should be viewed as tools that help CIOs to understand how they feel about the future today (see Note 3). We recognize there may even be mixes of scenarios and parallel

scenarios playing out, battling each other, forcing people, organizations and countries to make choices. Certainly, some manufacturers will be positioned in multiple scenarios, depending on their markets, regions and organizational structures.

For example, a manufacturer's mass-production business unit could fall into one scenario, while its engineered solution business unit could reside in a different one. In some cases, manufacturers may choose to transform so they can align with a different scenario from today.

Each report explores one of the four potential scenarios, using the following characteristics:

- **Innovation** — A manufacturer's approach to incorporating innovation into its processes, its willingness to invest in new technology and its risk-reward requirements.
- **Attributes and culture** — General, high-level characteristics, qualities and traits that describe manufacturers that may occupy a specific quadrant. Values, attitudes, behaviors and policies that define (among other things) a company's approach toward change, performance, innovation, organizational structures and risk.
- **Market dynamics and customer engagement** — Customer, competitive, price and other factors that influence product development, go-to-market and operational strategies. Knowledge of and connection to customers' needs, requirements and preferences, which drives corporate strategy.
- **Operational focus and technology** — A manufacturer's operating priorities and supply chain partnerships; for example, getting to market quickly, responding rapidly to market changes, increasing profitability and ROI, or focusing on continuous process improvement. Technology infrastructure (legacy, leading edge or bleeding edge) and how that technology supports (or does not support) the company's innovation philosophy. Processes that ensure that information technology resources are used effectively and efficiently to enable a company to achieve its goals.

The individual reports explore each scenario in more detail and are described below.

### Companies in the Systematic Scenario Protect the Franchise

In 2023, companies in the Systematic scenario typically will be well-established, with long-standing brands and market presence. They will be solid, good at what they do and have proud traditions of doing so. These companies prefer consistent, uniform customer requirements. Their approach to change is structured and in the context of operational excellence: iteratively improving internal processes and functions, yet not bringing game-changing products or services to markets.

Self-assured, and entrenched, these companies will not perceive any external or internal reasons that justify significant changes to the culture of their company or their offerings in the near term. Instead, they will remain extremely competitive and fiercely protective of their market share and brand through 2023.

The planning cycle at these companies usually will be long but with solid, short-term ROI. Rather than being customer- or product-driven, innovation investments must meet high financial hurdles,

while aligning with a well-thought-out, risk-averse strategy that primarily invests in technology that improves operating efficiencies.

### Companies in the Opportunistic Scenario Find the Right Things to Do, and Do Them Faster and Better

In 2023, the enterprises in the Opportunistic scenario will target markets (or even market segments) that have uniform customer requirements. However, they will recognize that segmenting the market to create different opportunities is a critical strategy. As a result, they will embrace a more fluid approach to change. Their approach to innovation will be orchestrated yet adaptive, and revolve around careful portfolio management. Yet they will be open to new ideas and approaches to manufacturing, providing lower ROI hurdles that open them up to more risk and more opportunities.

These enterprises will be fast followers and work hard to find unique ways to configure capabilities and solutions. Then, they will fine-tune their offerings and apply continuous-improvement techniques to deliver a consistent response to each market or customer segment they serve. These companies will nurture a culture where everyone, from management to the production floor, is encouraged and enabled to do everything a little bit better, every time. They will be resourceful, cost-conscious and attuned to customer needs.

### Companies in the Unconstrained Scenario Pioneer New Sectors

The manufacturers in the Unconstrained scenario will offer products and services that can be customized to meet unique customer requirements, by anticipating, creating and detecting emerging trends even before the customers themselves. As trends evolve, successful players will have a fluid approach to change with a willingness to transform their business model both externally and internally. These changes include willingness to change offerings, adapt new capabilities, and even suffer short-term losses to be recognized as a disruptor.

These manufacturers will seek to establish their role as disruptor in their sector as well as in adjacent industries, seeking innovation from nontraditional sources and partners. This approach requires a greater focus on agility and logistical efficiency to produce customized products and services at a similar cost and delivery time frame as mass-produced goods.

By the way, “unconstrained” does not mean “unstructured.” Companies in this scenario are simply more willing to take risks to establish a brand. They will also seek to disrupt the market with a much higher level of engagement with their customers.

### Companies in the Experimental Scenario Drive Innovation With Data

In 2023, manufacturers in the Experimental scenario will have a large portfolio of modular, value-based products and services that they can change or improve incrementally without significantly changing processes or decreasing quality. They will heavily use data, analytics and proofs of concept to support innovation, technology and offerings, which makes decision making more grounded in data than in intuition. As a result, these companies will quickly recognize trends and will initiate product and service offerings and, if necessary, swiftly alter or abort them.



Companies in this scenario will organize themselves to fluidly manage a large volume of products (and problems), handle a high cadence of new product and service development and implementation, and scale to meet market needs. They will be innovators that recognize that they must innovate to stay competitive. However, they will not adopt technology disruptions without a good research and data foundation. While not risk-averse, they will exemplify the concept of incubating multiple projects on a small scale, evaluating benefits, and then scaling up quickly and sustainably as needed.

## Comparing the Manufacturing Industry Scenarios in 2023

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While the individual reports offer more detail and insights, Figure 5 summarizes the key characteristics of each manufacturing scenario.

Figure 5. Comparison of Manufacturing Industry Scenarios in 2023

Characteristic	Systematic Scenario	Opportunistic Scenario	Unconstrained Scenario	Experimental Scenario
<b>Attributes and Culture</b>				
Approach to change	Laggards	Followers or leaders	Leaders	Fast followers
Approach to innovation	Control-driven	Competency-driven	Leader-driven	Process-driven
<b>Market Dynamics and Customer Engagement</b>				
Approach to costs	Cost-efficiency	Cost-conscious	Cost-agnostic	Cost justification
Product requirement drivers	Financial benefit	Market research	Social analytics	R&D
Exerts customer influence with	Traditional marketing	Targeted marketing	Social influencers	Targeted or social influencers
Typical market	Established	Competitive	New sector	Evolving
<b>Innovation</b>				
Approach to improvements	Iterative improvement	Incremental improvement	Radical improvement	Periodic improvement
Drivers to propel growth	Designated teams	External partnerships	Crowdsourced	Internal teams
Implementation focus	Product finance	Brand finance	Brand customer	Product customer
Business model	Traditional	Agile	Disruptive	Willing to change
<b>Operational Focus and Technology</b>				
Technology differentiation	Core applications	Market sensing	Bleeding edge	Configuration
Digitalization rationale	Product cost	Product differentiation	Product design	Product improvement
Customer needs met with	Added value	Gap in market	Unknown needs	Unique specifications

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Source: Gartner (September 2018)

We encourage reading the individual scenario reports for a deeper understanding of the respective scenarios and their meaning for the organization.

## Recommendations

CIOs and IT leaders should take the following steps for their organizations to gain the most benefit from this research collection:

1. Read the other reports in this series (even those that do not currently apply to the company) to glean relevant insights and advice.
2. Review and discuss the scenarios within the organization, while recognizing that different scenarios may apply to different business units or geographies.
3. Determine where the organization is on the scenario matrix today and whether the company is evolving to meet future challenges and uncertainties.
4. Work with enterprise architects to determine the scenario's impact on the IT organization's structure, information technology and processes.
5. Make scenario planning a key part of the overall planning process to help IT and business leaders prepare for disruption or sudden changes.
6. Engage with Gartner analysts to track technology and market trends. As a result, CIOs and IT leaders will not be blindsided by unforeseen events and can rapidly adapt the business model to respond accordingly.

In a period of uncertainty, such as the manufacturing industry faces through 2023, a single set of assumptions can be quickly invalidated, particularly since the pace of change is not a constant across the industry. Scenarios offer CIOs and their organizations a more robust process that can help them plan for a range of uncertainties over time.

## Research Highlights

The following reports form part of this linked set of research:

- "Manufacturing Industry Scenarios in 2023: Protect the Franchise"
- "Manufacturing Industry Scenarios in 2023: Find the Right Things to Do, and Do Them Faster and Better"
- "Manufacturing Industry Scenarios in 2023: Pioneer New Sectors"
- "Manufacturing Industry Scenarios in 2023: Drive Innovation With Data"

## Gartner Recommended Reading

*Some documents may not be available as part of your current Gartner subscription.*

"Four Definitions Make a Digital Business Strategy Process More Effective"

"Leaders Across the Organization: Use Individual Adoption Styles to Bust Through Organizational Change Resistance"

“The Future of Products — 7 Best Practices for Navigating the Industry-Focused Digital Transformation”

“More Than Digital Is Driving the Factory of the Future”

“Anticipate and Exploit the Top 12 Future Work Trends”

“Maverick\* Research: Operate Your Business Like a Lego Set to Win in Disruptive Times”

“Willful Disruption — Scaling, Operating and Changing the Digital Game: A Gartner Trend Insight Report”

### Note 1 Gartner Multidisciplinary Team Creating the Manufacturing Scenarios

Gartner’s multidisciplinary team includes 12 analysts from across the company. Team members, who work with clients worldwide, have specialties ranging from industry to technology focus. In addition to the authors of this report, Vincent Oliva and Frank Ridder participated in the process.

### Note 2 Questions to Create the Manufacturing Scenarios

Some questions that the team considered included:

- How will manufacturers innovate — for example, process, workforce, technology and services?
- How will manufacturers drive innovation to add value?
- How will manufacturers drive innovation to gain a competitive edge?
- What differentiates companies in each scenario?

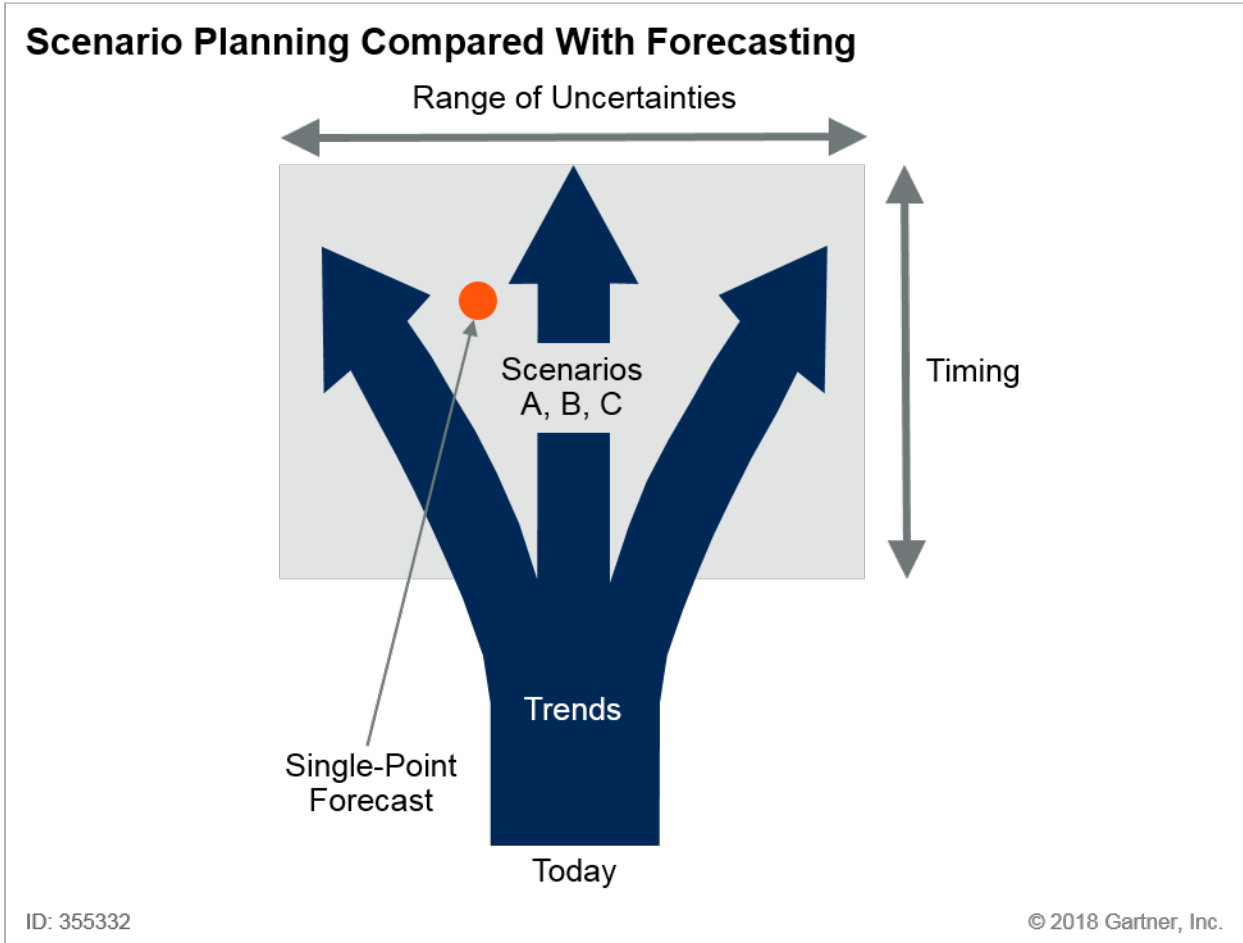
### Note 3 About Scenario Planning

At Gartner, we believe that scenario planning can be an incredibly useful tool for navigating through uncertain times. We have done this work for most of the industries that we cover. It has proven over time to be a great way for C-level teams to structure their thinking and inform their planning.

While market forecasts may be accurate in the near term or very near term, scenarios consider the unknowns, what cannot be predicted but can only be imagined. They enable management to move away from “one size fits all” thinking to consider several realistic futures and their impact, whether no changes are made or a transformation is undertaken. Scenarios provide context for the present and insights about the future, helping CIOs understand what their enterprise must do to succeed, should one of those futures — or a variation — come to pass.

As Figure 6 illustrates, scenario planning offers a significant advantage over traditional market forecasts. A forecast makes assumptions and then predicts one future outcome.

Figure 6. Scenario Planning Can Consider Several Realistic Outcomes



Source: Gartner (September 2018)

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